RESEARCH PROBLEM STATEMENT #PS-501

I – Problem Title
Developing Effective and Quantifiable Air Quality Mitigation Measures (AQ-04-01)

II – Research Problem Statement
The potential air quality impacts from the operation of a transportation project must be disclosed in the environmental document for the project. If the emissions for any air pollutant or contaminant would contribute to a violation of the applicable Federal or State air quality standards or are determined to be significant, those air quality impacts will need to be mitigated. However, there is currently a lack of available mitigation measures that are effective, quantifiable, and feasible for reducing project-level emissions of most air pollutants.

III – Objective
To develop a documented list of air quality mitigation measures suitable for use in the operational phase of a transportation project. Each mitigation measure developed must have been demonstrated to be effective in reducing project-level emissions, its emission reduction efficiencies must be clearly quantifiable using project-specific parameters, and it must be accompanied by a set of criteria to determine its feasibility for implementation at a project. A separate list of mitigation measures should be developed for each of the following six categories of air pollutants: (1) Carbon Monoxide (CO); (2) Oxides of Nitrogen (NOx); (3) Reactive Organic Gases (ROG); (4) Particulate Matter (PM)-Fugitive Dust; (5) PM-Diesel Exhaust; and (6) PM-Other Vehicular Emissions (i.e., non-diesel exhaust, tire & brake wear). This research will best serve the Department's goal of "Performance" (i.e., timely delivery of projects) and the CTP's goal of "Enhance the Environment" (i.e., improving air quality).

IV – Background
Air quality mitigation measures have been used in the construction phase of transportation projects, mainly to reduce fugitive dust emissions, in accordance with Caltrans' Standard Specifications and Standard Special Provisions. In some cases, additional dust control measures are also applied to meet local air districts' PM10 regulations. However, there are no parallel, established mitigation measures available for the emissions of PM or any other pollutant from the operation of a project. Mitigation measures are needed for CO for its microscale impacts, and for NOx and ROG for their precursor impacts on regional ozone. Also, it will become increasingly important to mitigate for PM because of the upcoming Federal PM2.5 standards, and specifically for diesel exhaust which has been determined by the California Air Resources Board to account for 70% of the overall air toxics risks.

V – Statement of Urgency and Benefits
Due to the current total lack of air quality mitigation measures for project operation, this research study is very urgent. The results will help expedite the completion of the Environmental Document phase of project development, and will enhance the timely

delivery of transportation projects while complying with Federal, State, and local air quality requirements.

VI –Related Research

UC-Davis is currently under contract with Caltrans Headquarters to compile a survey of available quantitative analysis methods (e.g. dispersion models) for determining the project-level impacts of various air pollutants.

VII – Deployment Potential

The product of this study will be immediately deployed at every transportation project that requires air quality mitigation measures. This research is independent, and is not part of a larger research project.